



Assessment Processes for Autism Spectrum Disorders: Purpose and Procedures

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Considering the heterogeneity of characteristics associated with autism spectrum disorders, it is not surprising that questions often arise about how best to evaluate children with this diagnosis. Thorough assessment depends on information gathered through a variety of methods and relies on the collaboration of many individuals including, professionals, family members, and educators. There is not a single test that when used alone can provide a definitive diagnosis of an autism spectrum disorder, or that can guide effective intervention planning. Assessment is a process that may serve a variety of purposes and involve a number of different procedures.

Purposes of Assessment

The first step in the assessment process is to consider the purpose of the evaluation. The purpose of the assessment will likely depend on the referral question, source of referral (e.g., parent, teacher, other professionals), and setting (e.g., school, clinic, residential placement). Screening for early indicators of autism spectrum disorder is one potential purpose of assessment. Another reason to conduct an evaluation would be for diagnostic purposes. A diagnosis of a Pervasive Developmental Disorder, which includes Autistic Disorder, Asperger Disorder, and Pervasive Developmental Disorder-Not Otherwise Specified, is usually based on criteria from the most recent version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; APA, 2000). Assessment for the purpose of diagnosis typically occurs in clinics or private practices and is led by psychiatrists, psychologists, or physicians. Psychologists employed by schools may also conduct a diagnostic assessment for the purpose of establishing eligibility for special education services. Another purpose of assessment could be to measure a child's cognitive and academic strengths and weaknesses, and/or emotional health. Often this type of assessment provides the best information for intervention and curriculum planning. Finally, assessment procedures may be used to document intervention efficacy or for research purposes. To summarize, the purposes of assessment are as follows:

- Screening
- Diagnosis/Identification
- Qualification for Services
- Assessment of Strengths, Weaknesses, and/or Emotional Health
- Intervention or Curriculum Planning
- Documentation of Intervention Efficacy/Research

Assessment Procedures

Assessment procedures depend on the referral question, referral source, setting, characteristics of the individual, and purpose of evaluation. A panel consisting of members of the Child Neurology Society, American Academy of Neurology, the National Institutes of Health, and various professional and parent organizations has established practice parameters for the diagnosis and assessment of autism spectrum disorders (Filapek et. al. 1999). This committee recommended a dual-level approach to the assessment of autism. Level One assessment entails screening all children considered at-risk for atypical development at every well-child visit. This initial screening includes general measures of developmental progress, using instruments such as The Ages and Stages

Questionnaire, Second Edition (ASQ; Bricker & Squires, 1999). If indicators of autism are found, then the child is screened for autism using tests specifically designed for this purpose. The Checklist for Autism in Toddlers (CHAT; Baron-Cohen, Allen, & Gillberg, 1992) is a short screening tool composed of nine questions for parents and involves five structured interactions between the examiner and child. The CHAT is used only to determine whether further diagnostic testing for autism is warranted, not to obtain a formal diagnosis. Early indicators of autism that are evident within the first year include lack of eye contact to initiate joint attention; emotionally distant behavior or dislike of affection; lack of imitation or social reciprocity; lack of functional use of nonverbal communication; and inappropriate use of toys. Screening for autism is also recommended if a sibling or other family member has a diagnosis within the autism spectrum. If a child is determined to be at-risk for a developmental disorder, then a second level of evaluation is pursued. The purpose of Level Two assessment is to establish a diagnosis and identify strengths and weaknesses for intervention planning. Specific procedures and tools that can be used for Level Two assessment are described below. The dual-level approach is designed to increase rates of early identification because early intervention has been shown to lead to better outcomes for children with autism spectrum disorders.

Indiana's Article 7 of the Indiana State Board of Education, Division of Exceptional Learner's stipulates an assessment process and procedures required to determine eligibility for special education services as a student with an autism spectrum disorder. The school's case conference committee is to determine a student's eligibility for services under the category of Autism Spectrum Disorders based on information obtained from the required evaluation procedures. Article 7 does not specify the order in which specific procedures are to be performed. The information provided below lists the specified procedures in a logical sequence that they would likely occur in the assessment process. Specific tests mentioned for each step are identified by the author and are not a requirement identified under Article 7. In addition, the following procedures are not unique to Article 7, and reflect best practices in assessment in general.

The first step in the assessment process is to interview the parents to obtain a social and developmental history and other information about the child's current level of functioning. Questions should be aimed at determining the onset of the disability, such as if the parents noticed early communication problems, awkward social interactions, unusual play, or hyper- or hypo- sensitivity to sensory stimuli. Information about family history of illness or psychopathology should also be obtained during the parent interview. There is a dramatic increase in the rates of autism in first-degree relatives, as well as an increased risk of social, communication, learning, and emotional difficulties (Filapek et al., 2000). If age-appropriate, the interviewer should inquire about the child's academic history and current educational performance.

A standardized tool for obtaining information about the child's developmental history and current functioning is the Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994). The ADI-R is a semi-structured interview for caregivers that addresses early and current development. It is comprised of five sections: opening questions, communication, social development and play, repetitive and restricted behavior, and general behavior problems. The interviewer uses the caregiver's descriptions of the child to code the behavior on a scale from 0-3, with 0 being absence of behavior and 3 representing extreme severity. Research on the ADI-R found good reliability and validity, although the results are somewhat limited by the small sample size used for the study (Lord, Rutter, & Le Couteur, 1994). Administration time is approximately 1-hour. Additional time is needed for scoring.

A logical next step in the assessment process would be to administer behavioral checklists to caregivers, teachers, and/or paraprofessionals. There are many rating scales available that measure a wide-range of behaviors (e.g., the Achenbach scales, Behavior Assessment System for Children). If an autism spectrum disorder is suspected, then Article 7 requires a checklist of characteristics that match current DSM criteria. The Gilliam Autism Rating Scale (GARS; Gilliam, 1995) is a reliable and valid instrument based on DSM criteria that is completed by a parent, teacher, or professional who is familiar with the child. The GARS takes 5-10 minutes to complete and has four

subtests: stereotyped behaviors, communication, social interaction, and developmental disturbances. It is used to estimate the probability of autism in children ages 3-22 and produces standard and percentile scores based on a normative sample of individuals with autism.

Another rating scale is the Asperger Syndrome Diagnostic Scale (ASDS; Smith-Myles, Bock, & Simpson, 2001). The ASDS is appropriate to use with individuals ages 5-18 who possess characteristics associated with Asperger Syndrome. It is completed by a person who knows the individual well, such as a teacher, a family member, or other caregiver. Items on the ASDS are based on DSM-IV criteria and are separated into five subscales: language, social, maladaptive behavior, cognitive, and sensorimotor. The ASDS takes 10-15 minutes to complete and yields standard scores, percentile ranks, and an Asperger Quotient (ASQ). The reliability of the ASQ is .83, but the subscales are less reliable when considered individually. The ASDS was found to discriminate between a sample of individuals with and without Asperger's at 85% accuracy.

Article 7 also requires an observation of the child across a variety of settings. In practice, the evaluation team rarely makes visits to the child's home, but information about the child's behavior in this setting provides valuable information that can aid in diagnosis and intervention planning. It should be noted that behaviors associated with autism spectrum disorders, must be present in all settings in order to receive a diagnosis. Observers should take special note of the child's level of communication (including practical conversation skills), social interaction, and engagement in restricted, repetitive, or stereotyped behaviors. The Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1988) is a tool that can be used to structure observations of children over the age of two. This scale has adequate reliability and validity. Often the CARS is used incorrectly as an interview or checklist. The primary source of information is gained through observations of the child, although the examiner can also use parent or teacher reports to supplement observational data. The CARS contains 15 items that were constructed based on Kanner's original description of autism and other characteristics associated with the behavior of young children with this disability. The examiner assigns ratings based on a four-point scale that describes the amount of deviation from typical development. The total rating is used to determine where the child falls in three categories defined by the test authors as nonautistic, mild-moderately autistic, and severely autistic. Although not specifically required under Article 7, direct interaction with the child is an important extension of the observation process. This provides the examiner with additional information about how the child interacts with others.

The Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, Risi, 2001) is a standardized assessment that utilizes a variety of structured and unstructured activities to elicit a wide range of behaviors associated with autism spectrum disorders. The ADOS examines the following areas: communication, social interaction, play, imagination, and stereotyped behaviors and restricted interests. This measure uses four different modules that are each individually designed for a particular developmental age and language ability level (from nonverbal to verbally fluent). The activities are meant to be enjoyable for the examinee while providing a standardized context for interactions. After the administration of the ADOS, examiners use their notes of observations collected throughout the evaluation and assign ratings in specific categories based on degree of abnormality. These ratings are used to determine an ADOS classification, which is used in conjunction with other assessment information to determine an overall diagnosis. The ADOS has adequate psychometric properties. Reliability is good overall, but Module 4, which is designed for older verbally fluent individuals, is somewhat less reliable. Items that were not found to adequately discriminate those with autism spectrum disorders from other individuals are not included in the final score but still can provide useful information. The ADOS does not differentiate Asperger Syndrome from autism; therefore, if Asperger Syndrome is suspected, the Asperger Syndrome Diagnostic Scale, which was described earlier, would provide a good supplement.

Standardized measures of intellectual ability and academic achievement are required under Article 7, but using such tests with individuals with autism spectrum disorders is controversial. In brief, standardized intellectual and achievement tests may not yield accurate results or provide useful information for treatment or educational

planning because they are heavily reliant on verbal ability, auditory processing, and the ability to follow sequential directions. These are areas of particular difficulty for individuals on the spectrum. In addition, the testing environment can be problematic (e.g., unfamiliar room and examiner, break in typical routine) and standardized procedures may be near impossible, especially if the child possesses behaviors that interfere with the testing process. The Wechsler tests and the Stanford-Binet-IV are commonly used for school-aged verbal children. The Stanford-Binet may be more appropriate to use with individuals with autism spectrum disorders because it has a lower floor (a greater number of items meant for a lower developmental age) and it also includes more nonverbal options and subtests that measure memory. For individuals who are nonverbal, the Test of Nonverbal Intelligence-Third Edition (TONI-3; Brown, Sherbenou, & Johnsen, 2001) and the Leiter International Performance Scale-Revised are options with good reliability and validity that do not require verbal responding. However, these tests may not provide an accurate measure of ability in individuals with autism either. For example, the TONI-3 requires the examiner to pantomime the directions. Individuals with autism spectrum disorders often have difficulty understanding nonverbal forms of communication, so this may be confusing for this group.

The adaptive behavior of the individual is another area assessed in the evaluation process. According to Sattler (1992), adaptive behavior assessment considers two issues, "(a) the degree to which individuals are able to function and maintain themselves independently and (b) the degree to which they meet satisfactorily the culturally imposed demands of personal and social responsibility." Parents, teachers, paraprofessionals, or other caregivers typically complete adaptive behavior checklists. An example of a reliable and valid measure of adaptive behavior is the Vineland Adaptive Behavior Scales (VABS; Sparrow, Balla, & Cicchetti, 1984). The VABS can be used for ages 0 to 18 and comes in three editions, two of which are completed by the examiner after conducting an interview; the other is filled out by a teacher or paraprofessional. All versions of the VABS measure five domains: Communication, Daily Living Skills, Socialization, Motor Skills, and Maladaptive Behavior. The VABS is norm-referenced and yields standard scores.

Finally, speech and language pathologists, occupational therapists, and/or physical therapists should evaluate the student to determine difficulties in related areas. The speech evaluations should measure not only receptive and expressive language, but also the social and pragmatic aspects of communication. Finally, fine and gross motor skills and sensory processing are evaluated, usually by an occupational therapist and/or physical therapist.

Recently there has been increased awareness of emotional difficulties, particularly anxiety and depression, experienced by high-functioning individuals with autism. Therefore, it is recommended that measures of social-emotional well-being be used in the evaluation process, especially when considering intervention planning. There are many reliable and valid tests for anxiety and depression available for use with children, adolescents, and adults that are easy to administer and score, adding little additional time to the overall evaluation process.

Summary and Conclusions

The evaluation of individuals with autism spectrum disorders can best be described as multidimensional. There are a variety of reasons why an assessment is initiated. Assessment procedures depend on the purpose of the evaluation, the referral question, the source of referral, and the setting of service provision. The dual-level approach to assessment involves screening all children at-risk for developmental delay for characteristics associated with autism spectrum disorder, followed by thorough diagnostic testing and evaluation of individual strengths and weaknesses. In Indiana, Article 7 articulates the process and steps that should be taken when determining if a child meets eligibility criteria for an autism spectrum disorder. Article 7 assessment procedures can be considered best practices for the assessment of autism spectrum disorders in general. The accurate identification and assessment of autism spectrum disorder is dependent on the assessment process, not the results of a single measure or procedure. As such, collaboration between professionals, parents, and teachers is a necessary component of an effective assessment process and an accurate interpretation of information gathered.

Lantz, J. (2003). Assessment processes for autism spectrum disorders: Purpose and procedures. The Reporter, 8 (1), 11-15. <http://www.iidc.indiana.edu/index.php?pageId=365>